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10/580,036	05/19/2006	Yasuo Kobayashi	291327US26PCT	9532

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OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C.

1940 DUKE STREET

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EXAMINER

LOUIE, MANDY C

ART UNIT

PAPER NUMBER

1792

NOTIFICATION DATE

DELIVERY MODE

06/09/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/580,036

Applicant(s)

KOBAYASHI ET AL.

Examiner

MANDY C. LOUIE

Art Unit

1792

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 May 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) 7 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF/ICE)
Paper No(s)/Mail Date 01/13/09; 05/19/06
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Invention I, claims 1-6 in the reply filed on 05/27/09 is acknowledged. The traversal is on the ground(s) that "a search and examination of the entire application would not place a serious burden on the Examiner". This is not found persuasive because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement for applications submitted under 35 U.S.C. 371 (i.e. inventions having unity of invention), where search burden is not necessitated for the basis of restriction for such applications. Furthermore, it is noted by the Examiner that an election of species has not been addressed for pending claims 1-7.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
4. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akahori [US 6443165] in view of Ohmi [US 20030178144] and Fong [US 5882414].

Regarding claim 1, Akahori teaches a method for cleaning plasma treatment system after depositing a fluorine containing carbon film (CF) film [abstract] on a substrate by using a plasma processing apparatus [col 3, ln 10-13] where the method include: mounting the substrate on the mounting table in the processing chamber [col 4, ln 5-7], forming a CF film of predetermined thickness on the surface of the substrate on the mounting table [col 4, ln 7-10], by supplying a rare gas into the plasma generation space [col 7, ln 1-3], supplying a film forming gas, which is a compound gas containing carbon and fluorine into the processing space through the gas supply openings of the gas supply member [col 7, ln 3-5], and activating the rare gas and the film forming gas by radiating microwave energies to deposit active species generated from the film

forming gas [col 7, ln 10-25], unloading the substrate on which the film is formed out of the processing chamber [col 7, ln 45-46], after unloading the substrate, supplying a cleaning gas containing oxygen into the plasma generation space (which will flow into the processing chamber) and radiating microwave energies to activate the cleaning gas for cleaning the inner surfaces of the processing chamber with oxygen active species generated from the cleaning gas [col 7, ln 45-64]. Akahori also teaches a precoat process may be carried out after the cleaning process [col 21, ln 58-60], which includes supplying the film forming gas into the processing chamber and radiating microwave energies to activated the film forming gas, forming a precoat film of fluorine coating carbon on the inner surface of the processing chamber with active species generated from the film forming gas [col 21, ln 61-67; col 22, ln 1-15], where the precoat film is thinner (i.e. 2 micrometers) [col 22, ln 13] than the CF filmed on the substrate (i.e. 5 micrometers) [col 8, ln 18]. It would have been obvious to one of ordinary skill in the art to form a precoat after the cleaning process. One would have been motivated to do so to prevent particles from scattering during deposition and reduce contamination [col 22, ln 20-44]. Furthermore, Akahori teaches the process may be performed for each substrate being treated [col 3, ln 52-54] for a plurality of substrates [col 21, ln 39] (the method repeating at least two times the following steps of (a) to (e)). Akahori appears be silent in teaching the particular plasma processing apparatus suggested by the Applicant. Ohmi remedies this.

Regarding claim 1, Ohmi teaches a plasma processing apparatus [abstract] comprising a processing chamber with a stage (mounting table) therein [0050], a flat

disk-like antenna body disposed at an upper portion of the processing chamber facing the stage, where the antenna body comprises a radial line slot antenna (plurality of slots) with the slots in a circumferential arrangement for radiating a microwave [0055; Fig. 3b] to radiate microwave energy [0055], a dielectric shower plate disposed under the planar antenna member which can function as an effective microwave-transmitting window (transmits the microwave radiated from the planar antenna member) [0051; 0055; Fig. 3a], and a conductive processing gas supply mechanism [0065] disposed between the dielectric plate and the stage to divide the inside of the processing chamber into an upper plasma generation space and a lower processing space [Fig. 3a], the gas supply member having a plurality of through-holes and a plurality of gas supply openings, the plasma generation space and the processing space communicating with each other through the through-holes [0067; 0077].

It would have been obvious to one with ordinary skills in the art at the time of the invention to apply plasma processing apparatus taught by Ohmi with Akahori to deposit a film. One would have been motivated to do so to improve film deposition (i.e. supplying a process gas uniformly and avoid temperature gradients) [Ohmi, 0021-0022].

Akahori in view of Ohmi appears to be silent in specifically cleaning a bottom surface of the dielectric plate. Fong remedies this.

Fong teaches a method for self-cleaning a blocker plate [title] with a plasma processing apparatus [abstract], where the prior art teaches providing a plasma of cleaning gases in both regions of an upper plasma generation space and a lower

processing space to thereby efficiently cleaning the bottom of the blocker plate [col 6, ln 10-24; 45-78].

It would have been obvious to one with ordinary skills in the art at the time of the invention to effectively clean the bottom surface of the dielectric plate with plasma of cleaning gases. One would have been motivated to do so to eliminate blockage that would cause non-uniformed deposition [Fong, col 2, ln 8-12] and develop a simpler and cost effective method that can be performed in situ rather than removing and replacing the entire gas diffuser system for cleaning [Fong, col 2, ln 54-56].

Regarding claim 2, Akahori in view of Ohmi and Fong teaches steps (d) and (e) are performed under the conditions that a dummy substrate is mounted on the mounting table in the processing chamber [Akahori, col 17, ln 63-65].

Regarding claim 3, Akahori in view of Ohmi and Fong teaches the gas supplying member is made of aluminum alloy [Ohmi, 0065].

Regarding claim 4, Akahori in view of Ohmi and Fong teaches a plasma gas (e.g. Ar gas) may be supplied with the cleaning gas in the cleaning treatment [Akahori, col 14, ln 24-26], wherein a cleaning plasma can be generated through the entire gas distribution system including the processing space [Fong, col 6, ln 18-22; 45-48]. It would have been apparent to one of ordinary skill in the art that such cleaning plasma generated in the processing system in order to clean the entire gas distribution system would also clean the surface of the gas supply member. Moreover, it would have been apparent to one of ordinary skill in the art that this step would be provided during the

cleaning step in order to not interfere during the deposition steps (i.e. depositing a film on a substrate or forming a precoat).

Regarding claim 5, Akahori in view of Ohmi and Fong teaches providing a step of supplying a gaseous mixture of oxygen containing gas and a rare gas into the processing chamber and radiating the microwave from the planar antenna member to activate the gaseous mixture, oxidizing the surface of the gas supply member with oxygen radicals generated from the gaseous mixture (as taught for claim 4). It would have been obvious to one of ordinary skill in the art at the time of the invention to omit the precoating step. One would have been motivated to do so in order to simplify the process and or to omit such step when it is not desired.

Regarding claim 6, Akahori in view of Ohmi and Fong teaches step (d) is performed under the conditions that a dummy substrate is mounted on the mounting table in the processing chamber [Akahori, col 17, ln 63-65].

Conclusion

1. No claim is allowed.
2. All the pending claims are subject to restriction/election requirement.
3. Claim 7 is withdrawn from restriction election.
4. Claims 1-6 are rejected for the reasons aforementioned.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MANDY C. LOUIE whose telephone number is

(571)270-5353. The examiner can normally be reached on Monday to Friday, 7:30AM - 5:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on (571)272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. C. L./
Examiner, Art Unit 1792

/Timothy H Meeks/
Supervisory Patent Examiner, Art Unit 1792